Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Recommendations Approved by World	)	**IB Docket No. 16-185**
Radiocommunication Conference Advisory	)	
Committee	)	

COMMENTS OF ONEWEB ON DRAFT RECOMMENDATION FOR WRC AGENDA ITEM 1.13

WorldVu Development Limited (dba "OneWeb") submits these comments in response to the Public Notice issued by the International Bureau on October 3, 2018, in the above captioned proceeding (the "PN").[1] The PN seeks comments on the World Radio Communications Conference Advisory Committee's ("WAC") draft recommendations in Attachment A to the PN and NTIA's draft proposals in Attachment B to the PN. These issues will be considered at the 2019 World Radiocommunication Conference ("WRC-19").

Introduction

Agenda Item 1.13 is "to consider identification of frequency bands for the future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution 238 (WRC-15)." The WAC Industry Working Group covering this agenda item did not reach a consensus but instead put forth two views—View A and View B.[2] OneWeb comments on both views, specifically addressing the 47.2-50.2 GHz band.

[1] *See International Bureau Seeks Comment on Recommendations Approved by World Radio Communication Conference Advisory Committee*, Public Notice, IB Docket No. 16-185, DA 18-1017 (October 3, 2018) ("PN").

[2] *See id.*, Attachment A at p. 3 (presenting the two opposing views in Document WAC/063).

Background

Under the ITU Radio Regulations for all three Regions, the fixed and fixed-satellite service ("FSS") (Earth-to-space) are co-primary in the 47.2-50.2 GHz band, where some parts of the band are allocated as uplink spectrum for the high-density fixed-satellite service ("HDFSS") operations in some regions. For example, ITU Radio Regulation No. **5.516B** identified the 48.2-50.2 GHz band as uplink spectrum for HDFSS operations (Earth-to-space) in ITU Region 2, paired with the 40-42 GHz band (space-to-Earth) (see **Resolution 143** (Rev. WRC-07)). Compare with Region 1, where ITU Radio Regulation No. **5.516B** identifies the 47.5-47.9 GHz, 48.2-48.54 GHz, and 49.44-50.2 GHz bands for HDFSS in the (space-to-Earth) direction.

OneWeb supports View A, which proposes no change to the Radio Regulations in the 48.2-50.2 GHz band with three major considerations:

1. the identification of this band in ITU-R Region 2 for HDFSS,
2. the United States Spectrum Frontiers decision to provide core uplink spectrum in the FSS in this band[3], and
3. the critical requirement for core spectrum for regional and international geostationary ("GSO") and non-geostationary ("NGSO") satellite operations.

However, View B supports the proposed identification of IMT in the 48.2-50.2 GHz band and proposes no technical or operational constraints be placed on IMT, claiming:

1. "Operational characteristics that are used by cellular providers, such as base station downtilt, that change on time scales needed to minimize intra- and inter-cell interference and also guarantee quality of service should not be encoded in the Radio Regulations."
2. ". . . with regards to the use of the band by high density applications in the FSS (No. [sic] **5.561B**)[4], no condition is required to achieve a balance of spectrum between FSS and IMT since this is a national matter and hence should not be included in any WRC Resolution."

As to the first point in View B, this one-dimensional and inward-looking view only serves to guarantee the interference-free operation of IMT with no regard to the protection and efficient operation of the co-primary FSS in the shared band. The second point in View B fails to recognize that NGSO FSS operators require reasonable regulatory certainty given their investments in global systems capable of providing broadband service anywhere in the Americas, where HDFSS operations are permitted pursuant to footnote 5.516B.

[3] *See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, *et al*., Second Report and Order, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, and Memorandum Opinion and Order, 32 FCC Rcd 10988 ¶ 189 (2017).
[4] This citation should read No. **5.516B**.

Discussion

Given the ubiquitous nature of HDFSS user terminals, View A properly emphasizes the need for access to spectrum where satellite end user devices can operate and be freely deployed without risk of interference to or from other services. Any identification for IMT in the 48.2-50.2 GHz frequency band (and the corresponding 40-42 GHz downlink band) would be contrary to this objective because great uncertainty in the interference environment for HDFSS operations will result from ubiquitous IMT deployments in these bands. Leaving it to individual countries to select whether to deploy FSS terminals or IMT stations in these bands is not conducive to the scalable deployment of either service:

- Ubiquitously-deployed FSS transmit earth stations, whether fixed, transportable, or in-motion could interfere into a neighboring country's IMT receivers, and
- Unconstrained transmit IMT stations (especially base stations) that operate with differing parameters than those used in the ITU-R studies may interfere into FSS satellite receivers.

Due to the Regional HDFSS allocation (space-to-Earth), View A correctly proposes no change to the 47.5-47.9 GHz segment in ITU Region 1.

View A recognizes that IMT will require access in a portion of the 47.2-50.2 GHz band for ubiquitously-deployed terminals and proposes that this access be limited to the 47.2-48.2 GHz band with the condition that "use of the mobile service allocation by IMT does not preclude the use of this frequency band by any application of the services to which they are allocated and does not establish priority in the Radio Regulations." OneWeb endorses this view of conditional use, including the three conditions for IMT services' use of the 47.2-48.2 GHz band:

1. a total radiated power limit and antenna electrical and mechanical downtilt standards for IMT base stations, which are necessary to avoid interference into FSS space stations at 47.2-48.2 GHz, or alternatively an EIRP mask for angles above the local horizontal plane;
2. mechanisms to permit continued access to the 47.2-48.2 GHz band by FSS gateway-type Earth stations which can be coordinated outside main IMT deployment areas; and
3. avoidance of IMT use of the space-to-Earth HDFSS identification at 47.5-47.9 GHz in ITU Region 1.

View A also proposes that FSS earth stations use the 47.2-48.2 GHz band alongside other co-primary services. For the services to coexist, View A puts forth a new footnote, with an associated Draft New Resolution [B113-IMT 47 GHZ] in the Radio Regulations, to assure that FSS use is not effectively or otherwise precluded from the band by providing technical and operational conditions on the IMT designation in the mobile service. OneWeb agrees that a new Resolution is required to ensure that mechanisms will be in place to ensure coexistence between the FSS and IMT.

However, OneWeb does not believe that current studies within the ITU-R have adequately addressed the issue of interference into the uplink of an FSS satellite from IMT-2020 base stations transmitting to IMT-2020 user terminals that are deployed higher than 1.5 meters above ground level. Moreover, the current wording in *resolves* 1b in the Draft New Resolution [B113-IMT 47 GHZ] may create an ambiguity given the current wording:

> *that, when deploying outdoor IMT base stations in the frequency band 47.2-48.2 GHz, administrations shall ensure that each antenna transmits only with the main beam pointing below the horizon and that the transmitting antenna shall have mechanical and electrical pointing below the horizon;*

The current wording of *resolves* 1b is ambiguous because OneWeb believes the intent was to reference the horizontal plane instead of the horizon. The word "horizon" may be interpreted as the physical horizon to be associated with the horizon profile of the physical horizon. If the physical horizon in a given direction (i.e., azimuth) was, for instance, five degrees above the horizontal plane at the base station, then a satellite at the "horizon" could be within the main-beam, i.e., in that same direction, as it would appear at the so-called "horizon." When drafting the text for the *resolves*, if the intent was to imply that (a) the IMT base station antenna transmit only with the main beam pointing below the horizontal plane and (b) the transmitting antenna shall have mechanical and electrical pointing below the horizontal plane, then the *resolve* should be redrafted to the follow:

> that, when deploying outdoor IMT base stations in the frequency band 47.2-48.2 GHz, administrations shall ensure that each antenna transmits only with the main beam pointing below the horizontal plane at the base station and that the transmitting antenna shall have mechanical and electrical pointing below the horizontal plane;

Conclusion

OneWeb supports View A as it creates a compelling case for no change in the 48.2-50.2 GHz band, thereby allowing continued access to spectrum in which uplink user terminals can be freely deployed across any given country. To reiterate, the band 48.2-50.2 GHz worldwide should not be identified for ubiquitously-deployed IMT use. For FSS earth stations to utilize the 47.2-48.2 GHz band alongside the other co-primary services, a new footnote with the associated Draft New Resolution [B113-IMT 47 GHZ] in the Radio Regulations as presented in View A is needed, and OneWeb supports View A with the editorial modification as outlined above.

Respectfully submitted,

/s/ Mariah Shuman

Mariah Shuman
Head of Regulatory Affairs, Americas
OneWeb
1785 Greensboro Station Place
Tower 3, Floor 8
McLean, VA 22102